

Netra™ X4200 M2 Server

Just the Facts

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Positioning



Figure 1. Netra™ X4200 M2 server

Introduction

Deregulation and privatization has created intense competition in the worldwide telecommunications market over the past few years. The marketplace continues to evolve as voice and data solutions become more integrated and next-generation wireless, video and messaging technologies emerge. Growing demand for scalable and available services coupled with modern economic realities are re-shaping the design of the telecommunications infrastructure. Now more than ever, availability of key services can dictate success or failure, with stringent service-level agreements increasingly common. At the same time, today's challenging economic climate means that successful organizations must consider issues such as total cost of ownership (TCO) and investment protection to make sure their decisions make long-term business sense.

The Netra X4200 M2 server delivers dramatic performance and flexibility along with space and power efficiency to meet the increasing demands of the network infrastructure. The Netra™ X4200 M2 server is Sun's first Netra server to incorporate the Next-Generation Advanced Micro Devices (AMD) Opteron™ all-dual core processors. Next-Generation AMD Opteron processors now support DDR2 memory and come with hardware-assisted AMD Virtualization™. In addition, the Next-Generation AMD Opteron processors offer a seamless upgrade path to Quad-Core AMD Opteron processors with the same consistent socket design.

The Netra™ X4200 M2 carrier-grade server offers flexibility and choice in a rack-optimized less than 20-inch deep 2RU enclosure. It runs both 32-bit and 64-bit applications on multiple operating systems and offers the choice of four internal hard drives maximizing storage capacity in a 2RU form factor. The Netra X4200 M2 server also integrates four Gigabit Ethernet ports to provide connectivity for high-speed, high-bandwidth networking. System uptime is enhanced by redundant hot-swappable AC/DC power supplies and hot-pluggable hard disk drives. Additionally, the Netra X4200 M2 server comes with Integrated Lights Out Management (ILOM) enabling simple remote monitoring and management from anywhere on the network providing the kind of reliability and serviceability features that global telecommunication companies demand.

As with other Netra servers, the Netra X4200 M2 is a ruggedized NEBS Level 3 certified and ETSI compliant server making it ideal for the most demanding applications in the toughest environments. In addition to supporting the Solaris™ Operating System, the Netra X4200 server also provides support for Linux and Windows operating systems offering customers unmatched agility, efficiency, and investment protection.



Key Messages

The Netra X4200 M2 server delivers dramatic performance and flexibility along with space and power efficiency to meet the increasing demands of the network infrastructure. Powered by up to two dual core Next-Generation AMD Opteron™ embedded class processors, the Netra X4200 server achieves extreme performance while its high compute density and low power consumption address constraints related to space, power, and cooling. The Netra X4200 server allows Sun to continue to offer customers choice and flexibility, simplicity, durability, and compatibility.

CHOICE and FLEXIBILITY

- Supporting the Solaris™ Operating System (OS), Linux and Windows operating systems, the Netra X4200 M2 server enables customers to run existing 32-bit x86 OS and applications on the same hardware as they migrate to a wide selection of Next-Generation 64-bit operating systems and their choice of applications. Customers can standardize on one hardware platform for all major operating systems in their network.
- The Netra X4200 M2 is the first Netra 2U rack server to offer the choice of four internal hard drives with no DVD or two internal hard drives with DVD giving customers the maximum flexibility for storage capacity.

SIMPLICITY:

- Ease of serviceability and Administration:
 - The Netra X4200 M2 was designed with features that include front and back system LEDs, front accessible hot-swappable drives, socketed system configuration chip and modular field replacement units (FR). Administration and recovery for the Netra X4200 is provided through the Integrated Lights Out Management (ILOM). The ILOM provides remote monitoring and diagnosis of the system and allows full remote KVM functionality with video and media redirection. In addition the optional Sun N1 System Manager software centralizes lifecycle management (discovery, configuration, provisioning, and monitoring) of groups of systems

DURABILITY:

- Ruggedized:
 - Ruggedized packaging provides a high level of system reliability which helps ensure that the Netra X4200 M2 servers continue to operate under the extremes of environmental conditions.

COMPATABILITY:

- Investment Protection:
 - Customers can standardize on one hardware platform for all major operating systems in their network. In addition, the Netra X4200 M2 supports full-height and full-length PCI-X cards allowing the use of legacy telecommunication cards.
- Continuity:



- Netra based servers are used around the globe in a variety of locations including telecommunications central offices and wireless base stations, Internet data centers, metropolitan area networks, POPs, and enterprise service provider infrastructures. The Netra X4200 M2 reaffirms Sun's commitment to customers who invested in the Netra product line by offering a product that delivers enhanced performance/throughput, consistent form, fit, and function.

Key Product Features, Functions, and Benefits

Feature	Function	Benefit
<ul style="list-style-type: none"> • Next-Generation AMD Opteron Processors 	<ul style="list-style-type: none"> • Native dual-core design • Delivers both 32- and 64-bit enterprise-class computing • Common socket design for Next-Generation and Quad Core AMD Opteron processors • AMD Direct Connect Architecture • AMD Virtualization™ Technology 	<ul style="list-style-type: none"> • Nearly doubles computing resources without power and cooling increases • Increases performance while providing investment protection for existing 32-bit application • Reduces data center churn as upgrade for increased performance • Integrated Memory Controller improves performance by more effectively handling the memory • AMD's Direct Connect Architecture helps guests run at near-native speed
<ul style="list-style-type: none"> • HyperTransport Technology and Integrated 128-bit wide DDR2 Memory Controller 	<ul style="list-style-type: none"> • Provides a high-speed connection between processor and core logic • Integrated controller pools memory resources onto a single coherent space 	<ul style="list-style-type: none"> • Eliminates performance bottlenecks found in traditional x86 Front Side Bus (FSB) architectures • Reduces power requirements of server chip by eliminating the need for a separate memory controller chip • Reduces memory bandwidth latency
<ul style="list-style-type: none"> • AMD Opteron Processors 	<ul style="list-style-type: none"> • Consistent processor thermal/power window requirements across all generations • Integrated Memory Controller • PowerNow! Technology: dynamic processor voltage and frequency throttling technology which works with server BIOS and operating system 	<ul style="list-style-type: none"> • Networks using Next-Generation AMD Opteron-based servers should experience less churn during performance upgrades as processor power requirements are planned not to increase • AMD Opteron processors do not require an additional memory controller chip • When running OS's supported by this product for PowerNow! technology, power consumption is minimized
<ul style="list-style-type: none"> • DDR2 Memory 	<ul style="list-style-type: none"> • Proven, cost-effective technology 	<ul style="list-style-type: none"> • DDR2 memory has been in the marketplace for years and requires less power than FBDIMM memory



Feature	Function	Benefit
<ul style="list-style-type: none"> • DDR2/667 memory with ECC 	<ul style="list-style-type: none"> • ECC helps to ensure data integrity with automatic error correction in case a single bit is affected by such events as alpha particle hitting a memory cell 	<ul style="list-style-type: none"> • Increases memory reliability, helping to reduce the chances of system downtime caused by memory failures
<ul style="list-style-type: none"> • Hardware RAID support provided by the onboard disk controller 	<ul style="list-style-type: none"> • Supports either two-disk RAID 1 (Integrated Mirror) volumes, or two-, three-, or four-disk RAID 0 (Integrated Stripe) volumes 	<ul style="list-style-type: none"> • Provides data redundancy and increased performance at no additional cost.
<ul style="list-style-type: none"> • NEBS Level-3 certification 	<ul style="list-style-type: none"> • Enables continuous operation in earthquake Zone 4 environments: complies with regulatory regulations for deployment in central office environments 	<ul style="list-style-type: none"> • Maximizes availability and decreases downtime due to environmental conditions
<ul style="list-style-type: none"> • Ruggedized enclosure 	<ul style="list-style-type: none"> • Provides the highest levels of protection from temperature fluctuations, humidity, vibration, pollutants, or other air contaminants such as dust; resist/retard fire or other electrical hazards 	<ul style="list-style-type: none"> • Increases reliability and availability. Minimizes downtime due to environmental conditions
<ul style="list-style-type: none"> • 19-inch 4 post rackmount kit and flip down bezel are standard with every system. Other rackmount kits available: 19-inch 2 post, 23-inch 2 post, 600mmx600mm, and 19-inch 4 post slide rail. 	<ul style="list-style-type: none"> • Provides ease of serviceability and ability to rack system in a variety of industry racks 	<ul style="list-style-type: none"> • Reduces service time and gives customers the flexibility to rack mount the Netra X4200 in a variety of different industry racks
<ul style="list-style-type: none"> • Dry Contact Alarms 	<ul style="list-style-type: none"> • Four programmable alarms are available in the Netra X4200 M2 server, these include Critical, Major, Minor, and User. Critical, Major, and Minor alarms are to be used to denote corresponding system states while User alarm is user-definable 	<ul style="list-style-type: none"> • Enables Telco operators to use a relay to signal fault conditions to a rack or control room panel as well as an alarm monitoring system
<ul style="list-style-type: none"> • Redundant AC/DC power supplies with separate power cords 	<ul style="list-style-type: none"> • A fully configured system can run on one power supply; the second power supply is for redundancy and load sharing 	<ul style="list-style-type: none"> • Increase availability and helps ensure uptime of critical applications.



Feature	Function	Benefit
<ul style="list-style-type: none"> Four onboard 10/100/1000-Mbps Ethernet ports 	<ul style="list-style-type: none"> Exceptional I/O performance and increased network reliability by providing redundancy 	<ul style="list-style-type: none"> Increases network efficiency, flexibility, and availability
<ul style="list-style-type: none"> Four PCI slots: three 133 MHZ PCI-X (full height, 2x full-length, 1x half height), one x8 PCI-E (MD2 low profile) 	<ul style="list-style-type: none"> For external connections to additional storage, etc. 	<ul style="list-style-type: none"> Full height PCI-X slots provide support for legacy telecommunication cards
<ul style="list-style-type: none"> Optional DVD RW 	<ul style="list-style-type: none"> Ability to read and write to a removable media access device 	<ul style="list-style-type: none"> Enables customers to store data on a removable media access device without external storage or hard drive requirements
<ul style="list-style-type: none"> Support for: <ul style="list-style-type: none"> - Solaris 10 OS on x64 - Red Hat and SuSE Linux - Windows Server 2003 	<ul style="list-style-type: none"> Run applications on industry standard platform running OS of choice 	<ul style="list-style-type: none"> Maximize application performance with best OS Ease transition to 64-bit computing Maximize IT investment by standardizing hardware to reduce required training and spares
<ul style="list-style-type: none"> Lights-out Remote Management 	<p>Sun Integrated Lights Out Manager (ILOM):</p> <ul style="list-style-type: none"> Remote management with full Keyboard, Mouse, Video, Storage (KVMS) Remote media capability (floppy, CD etc.) Full DMTF CLI Browser UI for control of the system through a graphical interface. IPMI 2.0 compliant for management and control SNMP v1, v2c, v3 for system monitoring Monitor and report system and component status on all FRUs 	<ul style="list-style-type: none"> All management which does not require physically touching the system can be performed remotely Easily integrates into customer's existing management environment by supporting industry standards ILOM is a core part of system, there is no additional charge for this functionality as with the competition
<ul style="list-style-type: none"> N1 System Manager 	<ul style="list-style-type: none"> Optional software provides complete hardware life cycle management for Sun systems from a single central console Available for a no-cost download at: http://www.sun.com/software/products/system_manager/index.xml Functions include: 	<ul style="list-style-type: none"> Reduces total cost of ownership and increases efficiencies of managing groups of Sun systems (supports SPARC and x64 systems). Provides fast and easy access to systems for monitoring and maintenance from a single centralized console. Enables 'one to many' grouped



Feature	Function	Benefit
	<ol style="list-style-type: none"> 1. Bare-metal discovery 2. firmware updating 3. OS patching 4. OS Provisioning 5. Monitoring 6. Event logging 	<p>commands, vastly reducing administrator overhead.</p> <ul style="list-style-type: none"> • Easily integratable with enterprise management tools.
<ul style="list-style-type: none"> • Sun Customer Ready Systems (CRS) program 	<ul style="list-style-type: none"> • For factory-configured, pre-racked, custom Netra X4200 M2 servers, refer to the CRS program website: http://www.sun.com/crs 	<ul style="list-style-type: none"> • Simplification and speed of system deployment

Product Family Placement

This product is a new entry in the Netra 2U product line.

- The Netra X4200 M2 server is Sun's first Netra server to incorporate the Next-Generation AMD Opteron all dual-core processors.
- The Netra X4200 M2 server is optimized for network workloads and is able to handle compute- and floating point intensive applications with large amounts (32 GB) of memory. It is a complimentary product to the Netra T2000 and is applicable for those customers that have standardized on the X86 architecture and require support for multiple operating systems.

Feature Comparison of Netra X4200 M2 and Sun Fire X4200 M2 Servers

Feature	Netra X4200 M2 Server	Sun Fire X4200 M2 Server
CPUs	Next-Generation AMD Opteron 2000 HE Series embedded processors (dual core only)	Next-Generation AMD Opteron 2000 Series processors (dual core only)
CPU Speed	2214 HE (2.2 GHz)	2220 SE (2.8GHz) 2218 (2.6 GHz), 2216 (2.4GHz), 2210 (1.8 GHz)
Level 2 Cache	1 MB Level 2 cache per core	1 MB Level 2 cache per core
CPU Interconnect	HyperTransport@ 4 GB/s	HyperTransport@ 4 GB/s
Max. memory	32 GB	32 GB
Max. internal disk drives	Up to two 146-GB (w/ DVD) or four 146-GB (w/o DVD) 2.5" SAS HDDs hot-swappable with support for Striping, Mirroring (HW RAID (0, 1))	Up to two 73/146-GB (w/ DVD) or four 73-GB (w/o DVD) 2.5" SAS HDDs hot-swappable with support for Striping, Mirroring (HW RAID (0, 1))
Graphics Controller	ATI Rage XL	ATI Rage XL
I/O	Tray Load DVD/RW (int) Two USB 1.1 ports	Tray Load DVD/CD-RW or DVD/RW (int)



Feature	Netra X4200 M2 Server	Sun Fire X4200 M2 Server
		Four USB 1.1 ports
PCI	Three PCI-X slots, full height, 2x full length, 1x half height One PCI-E slot, MD2 low profile	Four PCI-E slots, MD2low profile One PCI-X slot, MD2 low profile
Ethernet	Four on-board Gigabit ports	Four on-board Gigabit ports
Power supplies	Two 550W hot-swap AC/DC (1+1) (redundant)	Two 550W hot-swap AC/DC (N+1) (redundant)
Form factor	2 RU x 20"	2 RU x 24.8"
Integrated Service Processor	Yes, IPMI 2.0	Yes, IPMI 2.0
In-band management	IPMI v2.0 via KCS driver SNMP OS-resident agent	IPMI v2.0 via KCS driver SNMP OS-resident agent
Out-of-band management	IPMI v2.0;DMTF CLI; SNMP- v1, v2, v3; Web GUI	IPMI v2.0;DMTF CLI; SNMP- v1, v2, v3; Web GUI
Remote management featuresRemote Keyboard, Video, Mouse (KVM), and remote media capability Video redirection, Remote power control, remote access to BIOS, remote FRU status	Remote Keyboard, Video, Mouse (KVM), and remote media capability Video redirection, Remote power control, remote access to BIOS, remote FRU status	Remote Keyboard, Video, Mouse (KVM), and remote media capability Video redirection, Remote power control, remote access to BIOS, remote FRU status
System management paths	A single dedicated management 100BaseT port, system serial port and four system Ethernet ports	A single dedicated management 100BaseT port, system serial port and four system Ethernet ports
NEBS Level 3	Certified	N/A
Telco Alarms	YES	NO

Feature Comparison with Other Netra Rack Servers

Feature	Netra X4200	Netra T2000	Netra 240	Netra 440
CPU	Next-Generation AMD Opteron 2214 HE Series embedded processor (dual core only)	4, 6, 8 core 1.0/1.2-GHz UltraSPARC T1 CPUs	Up to two 1.5-GHz UltraSPARC IIIi CPUs	Up to four 1.6-GHz UltraSPARC IIIi CPUs
Threads	2 per CPU (4 max.)	32 max.	1 per CPU (2 max.)	1 per CPU (4 max.)
Max. memory	32 GB	32 GB (moving to 64GB)	16 GB	32 GB
Max. internal disk drives	Up to two 146-GB (w/ DVD) or four	Up to two 146-GB (w/ DVD) or four 146-GB	Up to two 146GB 15K Ultra160 SCSI	Up to four 146GB 15K Ultra320 SCSI



Feature	Netra X4200	Netra T2000	Netra 240	Netra 440
	146-GB (w/o DVD) 2.5" SAS HDDs	(w/o DVD) 2.5" SAS HDDs		
Removable media	Tray Load DVD/RW	Tray Load DVD/RW	Slimline DVD/RW	Slimline DVD/RW
Interfaces	Dual USB 2.0 ports, 1 x 10MB/s Ethernet, one serial	Dual USB 1.1 ports, 1 x 10MB/s Ethernet, one serial	Dual serial, Dual USB, 1 x 10MB/s Ethernet, one SCSI	Dual serial, Four USB, One SCSI, 1 x 10MB/s Ethernet,
PCI slots	Three 133MHZ PCI-X slots, full height, 2x full length, 1x half height One PCI-E slot, MD2 low profile	Three 133MHZ PCI-X slots, full height, 2x full length, 1x half height One PCI-E slot, MD2 low profile	3 PCI slots, full height, 1x full length, 2x half length	6 PCI slots, full height full length
Ethernet	Four on-board Gigabit ports	Four on-board Gigabit ports	Four on-board Gigabit ports	Two on-board Gigabit ports
Form factor	2U/16.7" / 20"	2U/16.7" / 20"	2U / 16.7" / 20"	5U / 17.32" / 19.5"
Solaris OS version	Solaris 10 for x86, Red Hat and SuSE Linux, Windows	Beginning with Solaris 10 6/06	Solaris 8, 9 and 10	Solaris 8, 9 and 10

Target Users

Target users are found in the following market areas:

- Network equipment providers, including wireless and wireline telecommunications infrastructures
- Service providers deploying data centers, POPs, or metropolitan area networks
- Government and military installations
- Manufacturing / Utilities

Target Applications

The Netra X4200 M2 delivers extreme performance and flexibility with optimum power and space efficiency for the below targeted applications.

- Media Gateway Controller
- Operations and maintenance for telecommunications network
- Signaling Gateway
- Intelligent Network
- MMS (Multimedia Messaging Services) /SMS (Short Messaging Services), Unified Messaging
- Application Server
- Web Server
- Content Caching, Network Proxy
- Home/Virtual location registries (HLR/VLR)



- Base Station Controller (BSC)
- Content Distribution Networks
- DNS Services
- Firewall (VPN/IPSEC)
- IP Traffic management
- Security
- Streaming Media
- Defense/Military /Intelligence applications include shipboard command and control, mobile weapons control and remote intelligence access servers
- Embedded OEM applications such as industrial process control, semiconductor test equipment and network imaging systems



Selling Highlights

Market Value Proposition

- The Netra X4200 M2 server delivers dramatic performance and flexibility along with space and power efficiency to meet the increasing demands of the network infrastructure. It is ideal for customers standardizing on a x64 platform infrastructure for mixed workloads, including single thread, multi-thread and FP applications. In addition, the Netra X4200 M2 server is applicable for customers requiring application flexibility and protection of asset investments, delivered through full Solaris binary compatibility, with support of Linux or Windows based applications.
- The Netra X4200 M2 server reaffirms Sun's commitment to customers who invested in the Netra product line by offering a product that delivers enhanced performance/throughput, consistent form, fit, and function.
- Ruggedized packaging and NEBS level 3 certification provides a high level of system reliability which helps ensure that the Netra X4200 M2 server continues to operate under extreme environmental conditions.

Availability

The Netra X4200 M2 server PTO standard configurations have reached general availability.

Customer-specific ATO configurations will lag the RR of PTO standard configurations by at least three months to help provide a smoother production ramp. GA of Customer-specific ATO configurations will lag their RR by at least one month.



Enabling Technology

Next-Generation AMD Opteron Processor Basics

The Next-Generation AMD Opteron processor leverages the same proven Direct Connect Architecture and CMP (Chip-level Multi-Processing) design features of the Single- and Dual-Core AMD Opteron (formerly known as Rev E) processors, including:

- 64-bit operating systems to provide full, transparent, and simultaneous 32-bit and 64-bit platform application multitasking
- Direct Connect Architecture
 - Addresses and helps reduce the real challenges and bottlenecks of system architecture
 - Memory is directly connected to the CPU, optimizing memory performance
 - I/O is directly connected to the CPU, for more balanced throughput and I/O
 - CPUs are connected directly to CPUs allowing for more linear symmetrical multiprocessing
- Integrated DDR2 Memory Controller
 - A 128-bit wide, on-chip DDR2 memory controller that supports ECC and ChipKill technologies and provides low-latency memory bandwidth which scales as processors are added
- AMD HyperTransport™ Technology
 - Provides a scalable bandwidth interconnect between processors, I/O subsystems and other chipsets
- Dedicated 1MB L2 Cache for each core

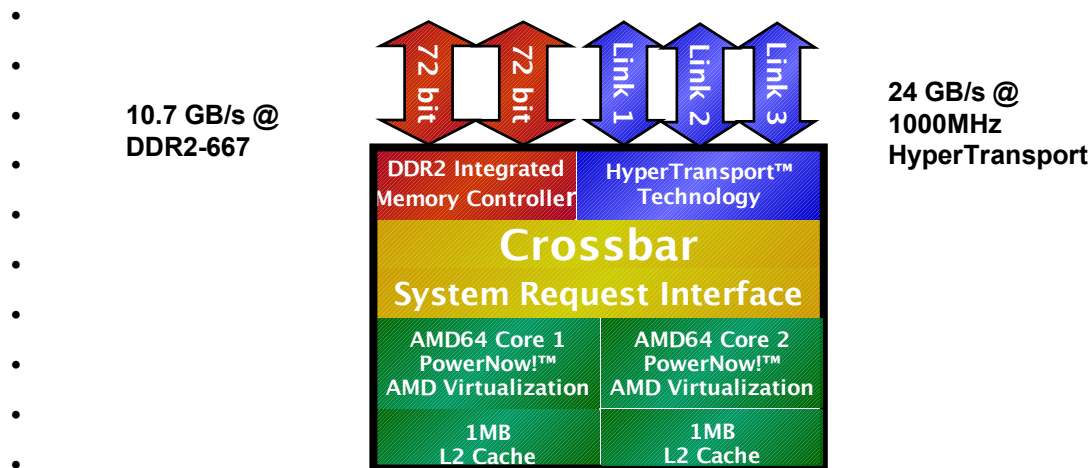


Figure 1: Next-Generation AMD Opteron Processor Design for Socket F (1207)



HyperTransport™ Technology

The Next-Generation AMD Opteron processor continues to use HyperTransport Technology links to provide a scalable bandwidth interconnect among processors, I/O subsystems, and other chip sets. HyperTransport Technology:

- Helps increase overall system performance by removing I/O bottlenecks typically found in Front Side Bus (FSB) architectures and efficiently integrating with legacy buses, increasing bandwidth and speed, and reducing latency of processors.
- Provides up to 8 GB/sec. bandwidth per link at 16x16 bits, 1 GHz operation, providing sufficient bandwidth for supporting new interconnects, such as PCI-Express.

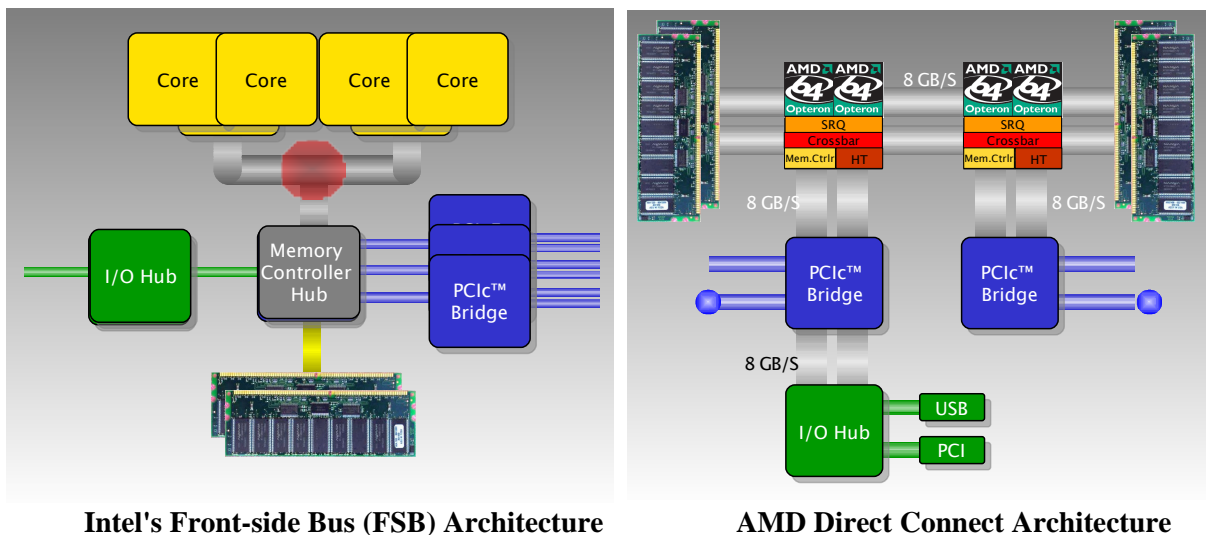


Figure 2: Intel versus AMD processor Architecture

Intel's Front Side Bus (FSB) architecture requires a separate memory controller. I/O bottlenecks and reduced efficiencies are seen as data from CPU to CPU, CPU to I/O and CPU to memory all funnel through a central Front-Side Bus.

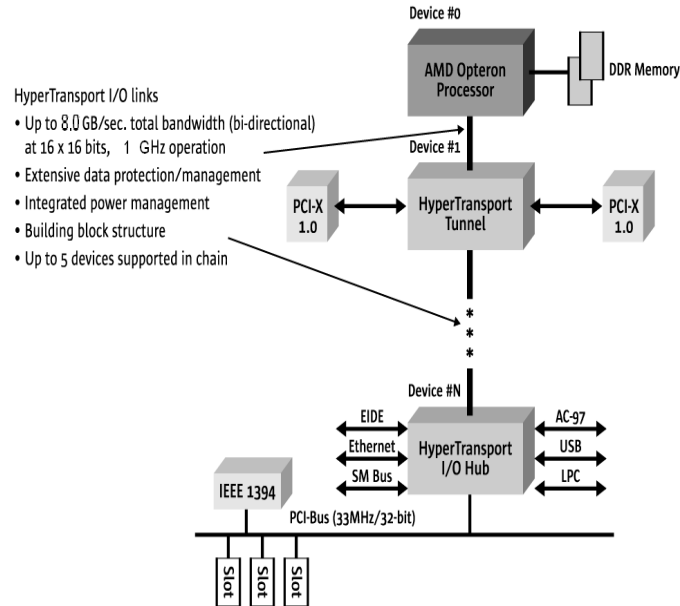


Figure 3: Sample HyperTransport Technology Interconnect Block

New Next-Generation AMD Opteron Processor Enhancements

The Next-Generation AMD Opteron Processor Design for Socket F (1207) (formerly known as “Rev F”) is a redesign of the original Dual-Core AMD Opteron (formerly known as “Rev E”) design and offer the following enhancements:

- New socket design, all native dual core processors
- Consistent processor power requirements
- Supports lower power DDR2 memory technology
- Consistent socket design and power requirements planned for Quad-Core AMD Opteron processors
- AMD PowerNow! Technology
- AMD Virtualization™ support (formerly known as Pacifica)

AMD PowerNow™ Technology

AMD PowerNow™ is a dynamic processor voltage and frequency throttling technology that works in conjunction with a server's BIOS and the operating system to minimize power consumption under less than maximum workloads.



For AMD PowerNow technology to work, **both the operating system and server BIOS must be qualified to run AMD's PowerNow**. Please see below for specific product support.

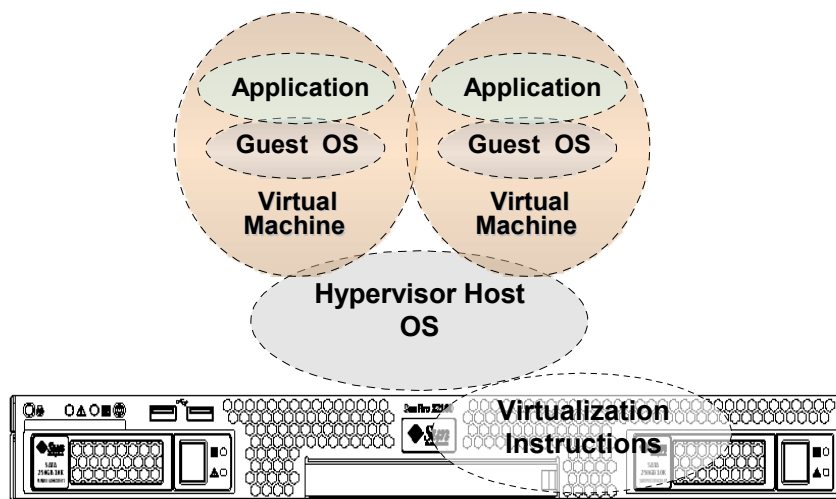
Solaris Support for PowerNow!

Solaris Engineering is currently aggressively working to add PowerNow support. Solaris is targeting a patch to add support at the end of this calendar year. PowerNow support is targeted for the Solaris 10 Update 4 release, planned to be released in Jan/Feb 2007.

For more information on AMD PowerNow, see:

<http://enterprise.amd.com/us-en/Technology/PowerManagement/>

AMD Virtualization™ Technology



Virtualization enables data centers to achieve higher levels of efficiency, utilization and flexibility by dividing a computer into several virtual machines or consolidating many systems onto one virtual machine.

Hardware-enabled AMD Virtualization™ offers:

- Reduces complexity of virtualization software by adding instructions to the hardware
- Reduces overhead by selectively intercepting information destined for guest OS's
- Enables simpler implementation and support by allowing guest OS's to run unmodified.
- Improves security of virtual machines by increasing isolation of host and guest OS's.
- Improves efficiency of switching between hypervisor and guest OS's through tagged TLB memory architecture.



System Architecture

Overview

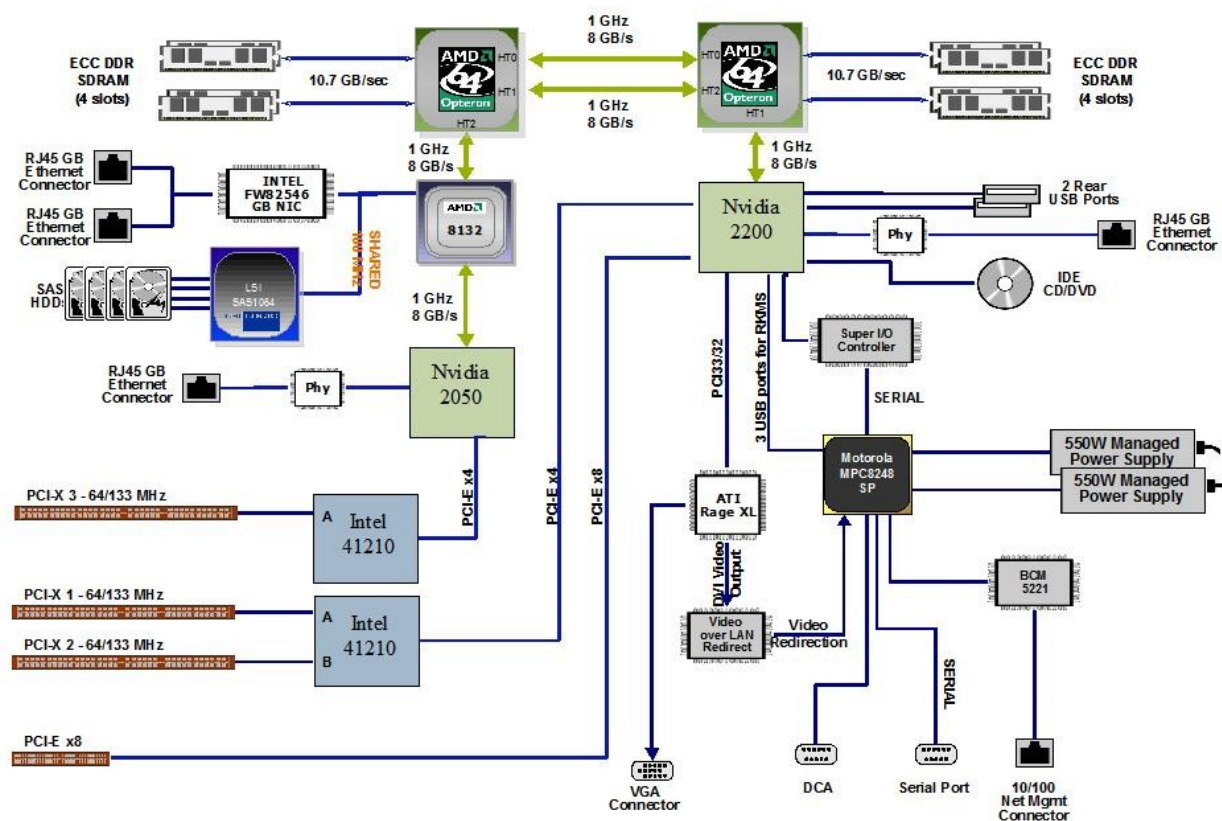


Figure 4. Netra™ X4200 M2 server block diagram

The Netra™ X4200 M2 server comes with the following major components:

- The Next-Generation AMD Opteron 2214 HE (embedded class) processors
- Up to 32 GB of DDR2 SDRAM memory in 8 available memory slots
- Four on-board Gigabit Ethernet ports
- Three PCI-X (full-height, 2x full-length and 1x half-length) slots and one PCI-Express MD2 low profile slot
- Up to two SAS disk drives with a tray-load DVD or four SAS disk drives with no DVD



Overview

The Netra X4200 M2 server features two CPU sockets that support Next-Generation AMD Opteron, model 2214 HE (L1 socket) embedded class processors. The server is supported with one or two processors and each processor controls 2 pairs of DIMM slots, for a total of eight DIMM in a two CPU system. There is a 6.4 GB/sec. access between processor and memory and one 1GHz 16x16 HyperTransport link between the two processors (8 GB/sec. Bandwidth). Through HyperTransport, each processor can access the other processor's memory. In a system with a single CPU, the processor must be placed into the designated processor slot0 that connects to the rest of the I/O infrastructure; this processor only has access to 2 pairs of memory slots or maximum of 16GB using 4GB DIMMs.

The Netra X4200 M2 server supports 1 GB, 2GB and 4 GB registered DDR2-667 memory, for a system with up to a total of 32 GB of memory. For optimal performance in both servers, memory DIMMs need to be installed in pairs so the processor is able to run in 128-bit ECC mode. Systems with an odd number of DIMMs are supported, but the processor will run in 64-bit ECC mode, reducing performance.

On-board management for the Netra X4200 M2 server is provided by a separately-powered Service Processor (SP) based on a Motorola MPC8248 microcontroller that communicates with the two main system processors and the rest of the system. Accessible to the end user through a serial port and a dedicated 10/100 Ethernet NIC, ILOM provides the administrator with full lights-out manageability of these servers which includes the ability to power cycle, setup, manage, monitor and maintain the system locally or remotely. ILOM supports both local and remote management, including remote KVM and media connectivity. ILOM also provides industry standard GUI and CLI interfaces. IPMI 2.0 and SNMP V1, v2c, V3 support also enable fast integration into a customers' existing monitoring schema.

Refer to the Netra X4200 M2 server block diagram for more details.

Expansion Slots

The Netra X4200 M2 server is well equipped with both legacy PCI-X slots, and the more current PCI-E high-speed slot.

- **PCI-Express Slots**

PCI-Express (PCI-E) is a high speed, point-to-point dual simplex chip interconnect. It is designed as the next-generation system bus interconnect, replacing the aging PCI bus. PCI-E operates at 2.5GHz and supports lane widths of x1, x4, and x8 in the Netra X4200 M2 server.

One x8 PCI-E slot is provided. The slot can also accommodate x1 or x4 cards. Most cards, including InfiniBand cards, currently do not require more than a x4 slot for full bandwidth operation. Graphics cards are the only currently available device that can come close to requiring the full x16 operation that PCI-E can offer. These larger slots are usually provided specifically for graphics cards in high-end 3D visualization-oriented workstations.

- **PCI-X Slots**

Three PCI-X slots are provided on the Netra X4200 M2 server to allow customers who need older PCI or PCI-X I/O cards to continue using the older generation of cards. The PCI-X slots are all full-height and two are full-length while one is half-length. They were designed to be able to support legacy telco PCI cards that are still full height and full length.

The provided slots are both 133MHz, 64bit wide, 3.3V providing the highest speed available for the older cards that are available in PCI-X configurations.



Internal Hard Disk I/O Subsystem

The Netra X4200 M2 server supports up to four hard disk drives, controlled by an LSI SAS1064 controller providing four ports of SAS connectivity to disk drives at bandwidths of 3Gb/sec. full duplex for each disk.

Disks are NEBS Certified 146-GB, 10000-rpm SAS disks, 2.5-inch small form factor server grade, and are certified for 24x7 operation. Due to the small physical size of these drives and the high spindle speeds, access times to disk are extremely good. All disks are hot-pluggable.

A benefit of using small disks is that they allow designers to maximize the air intake area at the front of the server to improve airflow, further increasing environmental margins and server reliability.

Hardware RAID (striping and mirroring) is supported on the Netra X4200 M2 server. RAID technology allows for the construction of a logical volume, made up of several physical disks, to provide data redundancy, increased performance, or both. The Netra X4200 M2 server onboard disk controller supports the following RAID configurations:

- Integrated Stripe, or IS volumes (RAID 0)
- Integrated Mirror, or IM volumes (RAID 1)

Power Supplies

The Netra X4200 M2 server is equipped with a dual redundant hot-swappable power supply system. One power supply is sufficient to run a fully populated server, however for maximum protection against power supply failures, Sun recommends that both power supplies be installed in the system at all times.

The power supplies are rated at 550 watts each. In normal operation, the power supplies share the power demands of the system equally between the pair.

Refer to the Specifications section for more information on power ratings.

Front and Back Panel Features



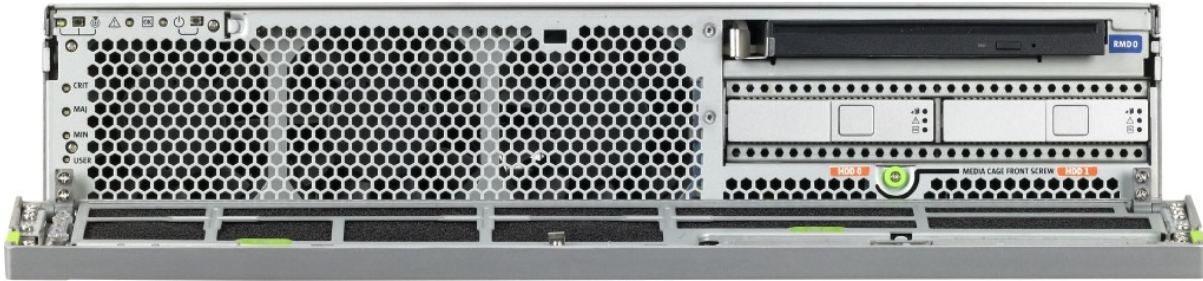


Figure 5. Netra X4200 server front panel features (2 Hard Disk Drive Version)

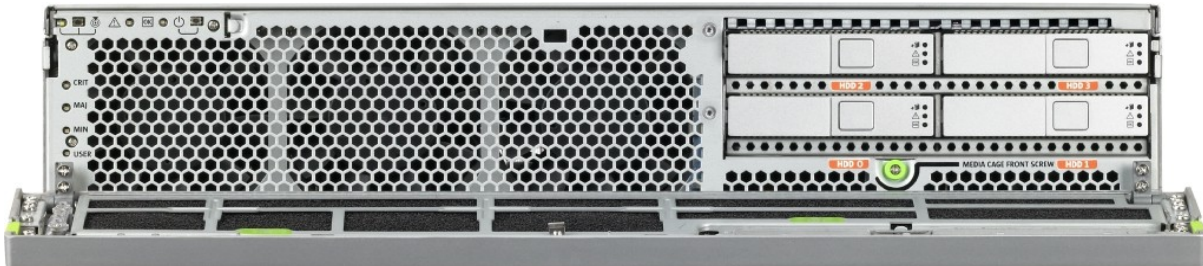


Figure 6. Netra X4200 server front panel features (4 Hard Disk Drive Version)



Figure 7. Netra X4200 server rear panel features

Connectivity

Networking

The Netra X4200 M2 server includes four on-board auto-negotiating Gigabit Ethernet ports. These ports are all capable of providing simultaneous full bandwidth operation, with no shared bandwidth limitations. Each of the four Ethernet RJ45 connectors is associated with two LEDs, one to indicate link status, the other to indicate network activity.

In addition, a dedicated 10/100BASE-T network management port is available on the back panel for a remote management connection to the ILOM Service Processor.



USB Ports

The Netra X4200 M2 server comes with two USB 2.0 ports. The two ports are located on the right side of the rear of the panel.

Telco Alarm Port

A DB15 connector is provide Telco alarm access to the system. The telco alarm function and connector pinouts are same as Netra 210/ Netra 240/ Netra 440/ Netra T2000 systems.



Reliability, Availability, and Serviceability (RAS)

Reliability, availability, and serviceability (RAS) are aspects of a system's design that affect its ability to operate continuously and to minimize the time necessary to service the system. Reliability refers to a system's ability to operate continuously without failures and to maintain data integrity. System availability refers to the ability of a system to recover to an operational state after a failure, with minimal impact. Serviceability relates to the time it takes to restore a system to service following a system failure. Together, reliability, availability, and serviceability features provide for near continuous system operation.

To deliver high levels of reliability, availability, and serviceability, the Netra™ X4200 server offers the following features:

- Simplicity of design with the AMD Opteron processors and HyperTransport requires less components and thus provides higher reliability
- ECC memory with ChipKill supported
- Up to two hot-pluggable hard drives with DVD or up to four hot-pluggable hard drives with no DVD
- Hardware RAID (0 + 1) striping and mirroring
- Two redundant, hot-swappable AC or DC power supplies
- Built-in quad Gigabit Ethernet ports provide redundancy
- Environmental monitoring
- Easy access for most component replacements
- Dry Contact Alarms enable Telco operators to use a relay to signal fault conditions to a rack or control room panel as well as an alarm monitoring system.



Operating Systems

Netra X4200 M2 Server Operating Systems

A world-class performance platform, the 64-bit Netra X4200 M2 server allow customers to run the operating system that best fits their needs. With a multitude of operating systems fully supported and/or certified, the Netra X4200 M2 server provides customers with more choices, within the same hardware architecture, than competing servers in its class.

Supported Operating Systems

The Netra X4200 M2 Server supports Solaris 10 beginning with Solaris 11/06. In addition to Solaris the Netra X4200 M2 server support Linux and Windows (starting May 2007)

Linux and Windows Operating systems support is leveraged from the Sun Fire X4200 M2 server more information on the latest Linux and Windows OS support for the Netra X4200 M2 Server can be found on the following website link:

<http://www.sun.com/servers/netra/x4200/os.jsp>

Firmware and Drivers

For more information on the latest firmware and drivers for the Netra X4200 M2 Server can be found on the following website link:

weblink coming soon!!

Supported I/O Cards

Please refer to the Options section of this document for a complete list of I/O cards that have been NEBS tested for the Netra X4200 M2 sever. For specific Linux and Windows support for these cards, please refer to the following website as this is being leveraged from the Sun Fire X4200 M2 Server.

<http://www.sun.com/servers/entry/x4200/optioncards.jsp>

Supported Storage and Associated HBAs

Since the external storage systems support is leveraged from the Sun Fire X4200 M2 server more information for the Netra X4200 M2 Server can be found on the following website link:

For the latest supported storage and associated HBAs:

<http://www.sun.com/servers/entry/x4200/storage.jsp>

Please note that not all HBAs listed on the above website has been NEBS tested. Please refer the Options section of this document for a complete list of HBAs that have been NEBS tested.



Solaris 10 OS – The most advanced operating system on the planet

Key Messaging

In a class by itself, the Solaris Operating System is a significant leap forward from the Solaris 9 OS, establishing it in a class by itself when compared to competing operating systems. It offers many innovative technologies that fundamentally change the equation for organizations needing to reduce costs, reduce complexity, and minimize risk. The new features in the Solaris 10 OS bring mainframe-quality software to even the smallest single-processor servers and provide a stepping stone into tomorrow's data center.

For CIOs and Line of Business Managers who are dissatisfied with high infrastructure costs and security vulnerabilities in their workgroup server environments, the Solaris 10 OS on x64 brings a proven, enterprise-class OS at 1/11th the cost of Microsoft and 20-60% off the cost of Red Hat over three years. The Solaris 10 OS is designed to help organizations optimize system utilization levels, deliver extreme performance and provide virtually unparalleled security – all with relentless, around-the-clock availability.

- Optimal Utilization of computing systems is a priority for IT managers where server consolidation is a common approach and is improved in the Solaris environment by:
 - Solaris Containers enable as much as a 4x increase in system utilization by helping to efficiently and securely support thousands of applications per system. Highly configurable, Solaris Containers can dynamically adjust system resources to business goals within and across Containers with the added benefit of isolating applications from each other and from system faults, so a problem in one application cannot affect the system or other applications.
 - Solaris ZFS File System (zettabyte file system) integrates devices, storage, and file systems structures into a single structure, simplifying file system management and providing a reliable and flexible solution that can help reduce cost, complexity, and risk.
- Extreme Performance is delivered with optimization for the latest UltraSPARC(R), AMD Opteron and Intel Xeon processors as well as:
 - Dynamic Tracing (DTrace), designed for use live use in production situations, is a powerful tool for analyzing and diagnosing elusive problems and increasing system performance. It is non-invasive and has no system overhead when not in use, but with its pervasive coverage, root cause for intermittent system problems can be found quickly and performance gains in real-world applications have been optimized to run as much as 30 times faster.
 - A Unified TCP/IP Stack where the TCP and IP layers are partially merged, delivers a 30- to 50-percent improvement in network throughput with a 10- to 15-percent lower CPU load than previous Solaris OS versions.
- Unparalleled Security continues to be a focus as Solaris 10 OS adds significant features that can help defend against attacks by preventing unauthorized access to data and applications with:
 - Process Rights Management replaces the traditional UNIX(R) platform's “all or nothing” root mechanism with a fine-grained set of privileges for control over the resources and objects that processes can manipulate.
 - Solaris Cryptographic Framework library secures data flows by providing a set of programming interfaces for application-level and kernel-level cryptographic operations, allowing developers to utilize highly optimized cryptographic algorithms and providing transparent access to the same hardware encryption acceleration devices used by the operating system kernel.
 - Relentless Availability – Expected in a Solaris OS environment, predictive self-healing technologies provide new levels of application availability with:



- Solaris Fault Manager proactively handles system problems by removing components before failure. CPU, memory and I/O problems are diagnosed and corrected – before they can cause downtime.
- **Solaris Service Manager** manages application software running on the system, monitoring applications and restarting entire application trees if necessary.

Compatibility

- **Same OS—Low-End to High-End Systems.** The Solaris OS is built from a single source base and optimized to run on multiple platforms, providing customers with the same best of breed OS on SPARC, Opteron AMD64 64-bit, and x86 32-bit processor-platforms.
- **Solaris Application Guarantee Program.** This program guarantees binary compatibility between versions of Solaris OS on each platform and has been extended to include source code compatibility as well.
- **Linux Compatibility.** With unwavering support for interoperability and open standards, and a commitment to delivering customer choice, Sun has made Linux interoperability a high priority.
 - Six Key Linux Libraries included in Solaris OS are: Glib, Gtk+, JPEG, PNG, TIFF, and XML2
 - **Hundreds of Linux applications and libraries** are provided with the Solaris OS including the GNOME desktop.
 - Linux Compatibility Assurance Toolkit (LinCat) helps to simplify the process of porting Linux applications to run natively on the Solaris OS.

Pricing/Support

Solaris 10 OS is free to end-users upon registration and is available via free download . Media kits are available for purchase. Support is available at an additional charge.

Linux - Complementing Sun's Solaris OS Strategy

Key Messaging

Sun, the #1 systems provider, brings a Comprehensive Systems Approach to Linux--providing customers with a full Linux solution of hardware, OS choice with Sun's value added Sun Java(TM) Enterprise System, Sun Java Desktop System, tools, and services. Sun enhances standard Linux distributions with an integrated systems offering that includes fully supported OS, x64 rack-mount servers, and the Sun Java Enterprise System that simplifies platform support for customers and partners. Sun brings added value to the system offering with faster, low-cost hardware which is the primary concern for most Linux customers seeking cost-sensitive server alternatives.

- **Choice and Platform Neutrality – “The right tool for the right job”**

Customers can choose the OS platform to best meet their server to desktop computing needs.

- With the Sun Java Enterprise System for Linux, customers can standardize on a set of Java technology-based network services across their heterogeneous infrastructure of volume x86 systems based on the Solaris OS or standard Linux to large SMP systems from Sun on x64 or SPARC processor based systems.
- A growing line of Sun and third-party Intel Xeon and AMD Opteron processor-based servers allows Linux customers to scale to 64-bit computing
- Systems Approach - Simplified Operations - One-Stop Linux Support



Sun brings a complete systems approach to Linux: a value-added web services stack for the entire system, hardware, OS, tools, and applications backed by Sun's global support infrastructure.

- Delivering Linux--from leading vendors (Red Hat and SUSE Linux)--with front-line support and training worldwide from Sun on x64 (Xeon and Opteron processors) hardware platforms from Sun and third parties.
- Selling the simplest and most comprehensive middleware & web services offering with Sun Java Enterprise System.
- Optimized Java Technology – Java Everywhere – Broaden the reach of Java technology investments
 - Sun is focused on maximizing Java technology performance benefits and stretching customers' application investments by creating a common application engine.
 - Linux and Java platform integration - Alliances with Red Hat and SUSE Linux to distribute Sun's latest Java Virtual Machine (JVM(TM) machine) included as part of the OS distributions. (The JVM software technology allows the Java 2 Software to host applications on any computer or operating system without rewrite or recompile).

Pricing/Support

Subscriptions are available with or without media (CDs, manuals). All levels of support provide access to either Red Hat Network or SUSE's Linux Portal. During the support period, if any new versions of SLES or RHEL for AMD64 are made available, users with current support entitlements have access to those new versions from the maintenance sites of Red Hat and SUSE. Please see the "Services" section for more details.

Windows OS

The Netra X4200 M2 Servers will support the Microsoft Windows Server 2003 Enterprise and Standard Edition operating systems in May 2007. Sun System Service Plans will be available from Sun Microsystems at an additional charge. Please see the "Services" section for more details.

Please bookmark and refer to the following Windows on Sun sites for frequently updated information:

External: <http://www.sun.com/software/windows>

Internal: <https://onestop.central.sun.com/windows>

Key Messaging

- Flexibility for Sun's Heterogeneous Customers
 - To provide customers freedom to choose solutions that best meet their business needs, Sun supports the Microsoft Windows operating environment on select new Sun x64 systems.
 - The ability to run Solaris, Microsoft Windows, or Linux software on Sun x64 servers and workstations allows customers to use a single vendor to meet a wide range of requirements.
 - Sun's support for multiple operating systems enables customers to deploy their choice of operating system without having to change hardware platforms when their requirements change. This helps reduce the cost and complexity required to support and manage multiple vendors, in turn helping to increase return on investment while reducing risk.



System Management

Sun Integrated Lights-Out-Manager (ILOM)

Sun Integrated Lights-out Manager is driven by an integrated system service processor that follows x86 standards and is different from SPARC(R) technology-based system remote management solutions. It provides for full remote KVM (Keyboard, Video, Mouse, Storage) support together with remote media functionality. Lights-out management (LOM) is achieved using an on-board, independently powered service processor with its own robust, security hardened OS. ILOM provides remote administration via an intuitive browser-based GUI, DTMF CLI, remote console, SNMP v1, v2c, v3 or IPMI v2.0 protocols using the out-of-band management Ethernet, or using in-band communication through the server's operating system. With out-of-band management, the system administrator can remotely control power of the system, monitor system FRU status, and load system firmware. With in-band management, the system administrator can monitor system status and control system power down.

The Service Processor (SP) provides the following functions:

- Capability to remotely manage the server through remote keyboard, video, mouse, and storage redirection
- Extensive control and reporting over environmental, power, hardware and BIOS/OS features
- Remote flash upgrades of system BIOS and service processor software
- Remote diagnosis of failed components allows for rapid correction
- User configurable serial console accessible via a physical port or re-directed through the management network

Sun N1 System Manager - Management of One to Thousands of Sun Systems

Optional Sun N1 System Manager (N1 SM) software can provide comprehensive infrastructure life cycle management for Sun systems, delivering an efficient way to manage multiple systems across the datacenter while simplifying management tasks, reducing repetition, and lowering the Total Cost of Ownership of Sun x64 systems. N1 SM is provided with a **no-cost license** and is available for download from: http://www.sun.com/software/products/system_manager/index.xml

This software enables rapid discovery and provisioning of groups of bare metal Sun Fire X2100, Sun Fire X2100 M2, Sun Fire X2200 M2, X4100, X4200, X4500, X4600, V20z and V40z systems and Sun Blade 8400 Server Modules. In addition this software also supports Sun SPARC systems: Sun Fire V210, Sun Fire V240, Sun Fire V440, Netra 240, Netra 440, Netra T2000, Netra X4200 M2, Sun Fire T1000 and T2000 systems.

Key features include:

- Discovery of systems
- Grouping (for one-to-many commands)
- Bare Metal OS Provisioning
- System BIOS/firmware and OS updates
- Event Logging
- Lights Out Management
- Hardware Monitoring
- OS Monitoring
- Event Notification
- Role Based Access Control
- Hybrid UI with browser and CLI



ILOM Watchdog Timer

ILOM features a watchdog mechanism to detect and respond to system hang, should one ever occur. The ILOM watchdog is a timer that is continually reset by a user application as long as the operating system and user application are running. In the event of a system hang, the user application is no longer able to reset the timer. The timer will then expire and will perform an action set by the user, eliminating the need for operator intervention.

One of the benefits of the Netra X4200 M2 Watchdog Timer functionality is the end-to-end coverage, from power-on-reset, through BIOS and OS boot, to user application execution. If enabled in the BIOS setup menus (default operation is disabled), the ILOM WDT will be set by initial BIOS code execution to a configurable timeout threshold. If this time limit expires before the OS can boot, start critical services, and the application begins to reset the timer, the ILOM can be configured to reset or power-off the host server, generating an alert for remote management.

Standardized IPMI management interfaces will be provided to the user application to configure and reset the ILOM watchdog function (final implementation plan is TBD).



Specifications

Processor Options

Processor	One or two Next-Generation AMD Opteron Processor 2000 HE Series embedded class;Dual Core (2214 HE – 2.2 GHz)
Cache	1 MB Level 2

Main Memory

4 DIMM slots per CPU socket, Registered DDR2/667 ECC DIMMs (128 bit plus ECC databus), total 8 DIMM slots.
System configurations from 2 GB up to 32 GB (maximum of 16GB for single processor systems)

Standard/Integrated Interfaces

Network	Four 10/100/1000Base-T Ethernet ports
Network management	One 10/100Base-T Ethernet port
Serial management	One TIA/EIA-232-F asynchronous RJ45 Port
Video	One VGA vide port (HD-15)
SAS	Four channel SAS interface, internal access only.
USB	Two USB 2.0 ports (Rear)
Expansion bus	Three full-height internal 64-bit 133MHz PCI-X slots, 2x full-length, 1x-half-length One Internal x8 PCI-Express MD2 low profile slot
Alarms	Four fail-safe, dry contact alarms (critical, major, minor and user) (DB-15)

Mass Storage and Media

Hot-swappable, 2.5” SAS Internal disk	Up to two 146GB HDDs w/ DVD , Up to four 146GB HDDs w/o DVD, two different chassis
Internal DVD	One Slimline DVD/RW
External disk	Leveraged from the Sun Fire X4200 M2: See http://www.sun.com/servers/entry/x4200/storage.jsp

Software

Operating environment	Solaris 10 Operating System on x64, 64-bit Red Hat Enterprise Linux (available May 2007) SUSE Linux (available May 2007) Windows Server 2003 (available May 2007)
Sun Java Enterprise System 4	Solaris 10 on X64 Operating System Standard Linux distributions
Languages	C/C++, FORTRAN, Java programming language, all other standard Sun-



	supported languages
Networking Software	ONC™, ONC+(TM), NFS(TM), WebNFS(TM), TCP/IP, SunLink™, OSI, MHS, IPX™/SPX, SMB technologies, and XML
Management	CLI (in-band and out-of-band), IPMI 2.0 (in-band and out-of-band), SNMP (out-of-band only)

Physical Specifications

Description	U.S.	International
Height	3.5 inches (2 RU)	89 mm
Width	17.4 inches including bezel 16.7 inches no including bezel	442 mm including bezel 424 mm not including bezel
Depth	20 inches max depth 19 inches to the connector plane	508 mm max depth 483mm to connector plane
Weight, approximate (without PCI cards or rack mounts)	35lbs (2 disk version) 37.2lbs (4 disk version)	16 kgs (2 disk version) 17 kgs (4 disk version)

Environment Specifications

These are the environmental specifications for the Netra™ X4200 server.

Specification	Operating	Non-Operating
Temperature	5°C to 40°C, (41°F to 104°F) Short Term -5°C to 55°C (23°F to 131°F)	-40°C to 70°C (-40°F to 158°F)
Relative Humidity	5% to 85% relative humidity, noncondensing Short term: 5% to 90% relative humidity, noncondensing, but not to exceed 0.024 kg water/kg dry air (0.053 lbs. water/2.205 lb. dry air)	Up to 93% relative humidity noncondensing, 38°C (100.4°F) max wet bulb
Altitude	Up to 3000 meters (9,850 feet) @40°C	Up to 12,000 meters (40,000 feet)

Power Source Requirements

The Netra X4200 M2 server has two autoranging AC or DC power supplies. To ensure redundant operation of the power supplies, the two power inputs should be connected to separate power sources.

These are the electrical limits and ranges for the Netra X4200 M2 server utilizing 550W power supplies.

Description	AC Specification	DC Specification
Operating input voltage range	100 to 240 VAC, 50 to 60 Hz	-48VDC or -60VDC (nominal) -40VDC to -75VDC (range)
Maximum operating input current	6.5A at 100 to 120 VAC 3.2 A at 200 to 240 VAC	12.7A at -48VDC 10.2A at -60VDC
Maximum heat dissipation	2150 BTU/hr.	2085 BTU/hr.



Description	AC Specification	DC Specification
Nominal Power	Estimated 475 W	Estimated 475 W

Acoustic Noise Emissions

These are the acoustic noise emissions of a Netra X4200 M2 server. Declared noise emissions are in accordance with ISO 9296 standards.

Description	Mode	Specification
LwAd (1 B = 10 dB)	Operating acoustic noise	7.0 B
	Idling acoustic noise	7.0 B

Agency Compliance Specifications

The Netra X4200 M2 server complies with the following specifications.

Category	Relevant Standards
Safety	UL/CSA-60950-1, EN60950-1, IEC60950-1 CB Scheme with all country deviations, IEC825-1, 2, CFR21 part 1040, CNS14336, GB4943
Ergonomics	EK1-ITB-2000
RFI/EMC	<div> <div> EN55022 Class A 47 CFR 15B Class A ICES-003 Class A VCCI Class A AS/NZ 3548 Class A CNS 13438 Class A </div> <div> KSC 5858 Class A GB9254 Class A EN61000-3-2 GB17625.1 EN61000-3-3 </div> </div>
Immunity	<div> EN55024 IEC 61000-4-2 IEC 61000-4-3 IEC 61000-4-4 </div> <div> IEC 61000-4-5 IEC 61000-4-6 IEC 61000-4-8 IEC 61000-4-11 </div>
Telecommunications	EN 300 386, Telecordia SR 3580 NEBS Level 3
Regulatory Markings (pending)	CE, FCC, ICES-003, C-tick, VCCI, GOST-R, BSMI, MIC, UL/cUL, UL/DEMKO/GS, UL/S-mark, CCC
ETSI	EN 300 019-2-1,2,3, Class 1.2, 2.3, 3.1E - Except -5°C cold start - Except condensing humidity - Except rain
Seismic	GR-63-CORE requirements for earthquake zone 4



Ordering Information

Standard Configurations – Preconfigured Systems

The Netra X4200 M2 server run the Solaris 10 Operating System on x64 as well as standard Linux distributions and Microsoft Windows Server 2003, Enterprise and Standard Editions. For a list of supported OS versions, please refer to section “Netra X4200 M2 Server Operating Systems Support “

The Netra X4200 M2 server can be ordered using the configuration part numbers listed in this section. All servers ship with one or two dual core Next-Generation AMD Opteron processor Model 2214 HE embedded class. The processor in the Netra X4200 M2 runs at 2.2GHz with a 1-MB L2 cache.

Two power cords for the AC version specific to the environment or geography must be ordered as a separate line item.

All base configurations include:

- 2 RU packaging
- Up to two AMD Opteron (socket F (1207)) 2214 HE embedded class dual-core processors
- Eight memory slots supporting registered DDR2/667 MHz ECC DIMMs
- Two disk drive bays and DVD or Four disk drive bays and no DVD
- Four 1-Gigabit Ethernet ports
- One PCI-E slot (MD2 low profile)
- Three PCI-X slots (3x full-height, 2x full-length, 1x half-length)
- One Slimline tray loaded DVD drive
- Two USB 2.0 ports and one VGA port (HD-15)
- Integrated lights out manager (ILOM) with dedicated 100BASE-T Ethernet port and RJ45 serial port
- One 19 inch 4 post rackmount kit
- Two 550W (1+1) hot-swappable DC or AC power supplies



Standard Configuration Part Numbers

Part Number	Standard Configuration Description
N87-SFZ12H2GLAD	Netra X4200 M2 Server, 1x AMD Opteron Model 2214 HE dual core processor (2.2GHz/1MB), 2x1GB registered ECC DDR2-667 memory , one 146-GB, 2.5-inch 10000-rpm SAS hard disk drives, DVD drive, two DC power supplies, RoHS-5 compliant
N87-SFZ22H8GLBD	Netra X4200 M2 Server, 2xAMD Opteron Model 2214 HE dual core processor (2.2GHz/1MB), 4x2GB registered ECC DDR2-667 memory , two 146-GB, 2.5-inch 10000-rpm SAS hard disk drives, DVD drive, two DC power supplies, RoHS-5 compliant
N87-SFZ22H16GLBD	Netra X4200 M2 Server, 2xAMD Opteron Model 2214 HE dual core processor (2.2GHz/1MB), 4x4GB registered ECC DDR2-667 memory , two 146-GB, 2.5-inch 10000-rpm SAS hard disk drives, DVD drive, two DC power supplies, RoHS-5 compliant
N87-SFZ22H16GLDD	Netra X4200 M2 Server, 2xAMD Opteron Model 2214 HE dual core processor (2.2GHz/1MB), 4x4GB registered ECC DDR2-667 memory , four 146-GB, 2.5-inch 10000-rpm SAS hard disk drives, two DC power supplies, RoHS-5 compliant
N87-SFZ12H2GLAA	Netra X4200 M2 Server, 1x AMD Opteron Model 2214 HE dual core processor (2.2GHz/1MB), 2x1GB registered ECC DDR2-667 memory , one 146-GB, 2.5-inch 10000-rpm SAS hard disk drives, DVD drive, two AC power supplies, RoHS-5 compliant
N87-SFZ22H8GLBA	Netra X4200 M2 Server, 2xAMD Opteron Model 2214 HE dual core processor (2.2GHz/1MB), 4x2GB registered ECC DDR2-667 memory , two 146-GB, 2.5-inch 10000-rpm SAS hard disk drives, DVD drive, two AC power supplies, RoHS-5 compliant
N87-SFZ22H16GLBA	Netra X4200 M2 Server, 2xAMD Opteron Model 2214 HE dual core processor (2.2GHz/1MB), 4x4GB registered ECC DDR2-667 memory , two 146-GB, 2.5-inch 10000-rpm SAS hard disk drives, DVD drive, two AC power supplies, RoHS-5 compliant
N87-SFZ22H16GLDA	Netra X4200 M2 Server, 2xAMD Opteron Model 2214 HE dual core processor (2.2GHz/1MB), 4x4GB registered ECC DDR2-667 memory , four 146-GB, 2.5-inch 10000-rpm SAS hard disk drives, two AC power supplies, RoHS-5 compliant



Power Cord Kits

The Netra X4200 M2 server comes standard with two power supplies. A no-charge power cord kit option must be ordered for each AC power supply. Available power cord kits include:

Part Number	Description
X311L	AC power cord U.S./Brazil. Asia (except China) AC power cord, RoHS
X312L	AC power cord Continental Europe, RoHS
X312E	AC power cord China, RoHS
X386L	AC power cord Australia, RoHS
X312F	AC power cord Argentina, RoHS
X317L	AC power cord U.K, RoHS
X314L	AC power cord Switzerland, RoHS
X384L	AC power cord Italy, RoHS
X383L	AC power cord Denmark, RoHS
X312G	AC power cord Korea, RoHS
X332A	Taiwan Localized power cord kit,, RoHS

Assemble-to-Order Configurations (ATO)

Assemble-to-Order (ATO) configurations are not available now. They will be available in August 2007. The listed configurations and upgrades greatly reduce the need for custom configurations.

Netra X4200 M2 Server XATO Chassis Options:

Part Number	Description	Availability
N87-AD-Z	Netra X4200 M2 Base Chassis, Two HDD slots, 1 DVD Bay, 2 DC PSU, RoHS-5 compliant	August 2007
N87-AA-Z	Netra X4200 M2 Base Chassis, Two HDD slots, 1 DVD bay, 2 AC PSU, RoHS-5 compliant	August 2007
N87-BD-Z	Netra X4200 M2 Base Chassis, Four HDD slots, no DVD bay, 2 DC PSU, RoHS-5 compliant	August 2007
N87-BA-Z	Netra X4200 M2 Base Chassis, Four HDD slots, no DVD bay, 2 AC PSU, RoHS-5 compliant	August 2007



Options

The following options are supported by the Netra™ X4200 M2 server. Options that include an (X) in the part number indicate that the part can be ordered as a field-installable part or for factory integration. For example, X7800A is the field installable option, while part number 7800A, with the (X) removed, is used only when the part will be installed at the factory (ie Assemble-to-Order).

Part Number	Option Description	Maximum Number Supported	Comments
AMD Opteron 2000 HE Series			
(X)4351A-Z	Next-Generation AMD Opteron Model 2214 HE (2.2 GHz Dual Core 68 W)	2	August 2007
Memory			
(X)4225A-Z	2-GB Registered DDR2-667 kit (2 x 1GB)	8	
(X)4226A-Z	4-GB Registered DDR2-667 kit (2 x 2GB)	8	
(X)4227A-Z	8-GB Registered DDR2-667 kit (2 x 4GB)	8	
Internal Storage Devices			
XRA-SS2ND-146G10KZ	146-GB, 10000-rpm, 2.5-inch SAS disk drive	2	
RA-SS2ND-146G10KZ	146-GB, 10000-rpm, 2.5-inch SAS disk drive, for factory integration only (CRS)	2	
4354A-Z	Disk bay filler panel for Netra X4200 M2 x64 server. XATO and FACTORY INTEGRATION. ROHS-5		August 2007
Internal Media Devices			
(X)4356A-Z	Slimline DVD RW	1	
4355A-Z	DVD Bay Filler Panel Netra X4200 M2 x64 server. XATO and FACTORY INTEGRATION. ROHS-5		August 2007
Racks			
SR900-38	Sun™ Rack 900 - 38 (alloy)		
SR900-36N	Sun Rack 900 - 36N (alloy)		
SR1000-38	Sun Rack 1000 - 38 (alloy)		
SR1000-42	Sun Rack 1000 - 42 (alloy)		
SG-XARY030A	Sun StorEdge™ 72-inch expansion cabinet Sun Fire™ cabinet		
Rack Kits			
X7901A-4	19-inch 2 post rackmount kit		
X7902A-4	23-inch 2 post rackmount kit		
X7904A-4	600mmx600mm rackmount kit		
(X)8099A-4	19-inch 4 post slide mount kit		
Miscellaneous options			
X949A-4	Wago DC plug connectors, 10-pack		
X4234A-Z	Air Filter, 10-pack for 2 HDD version		



Part Number	Option Description	Maximum Number Supported	Comments
X4353A-Z	Air Filter, 10-pack for 4 HDD version		
PCI-E Cards: Networking Interfaces			
(X)7280A-2	Dual port GigE UTP low-profile, RoHS-6	1	Requires a shielded cable to pass ESD discharge requirements at 8KV
X4447A-Z	Quad GbE (X8)	1	Estimated NEBS complete end August 2007
X4446A-Z	Quad GbE (X4)	1	Estimated NEBS complete end August 2007
PCI-E Cards:Security			
X6000A/X6099A	Crypto Accelerator 6000 SSL/IPSec, RoHS-6/ Sun Crypto Accelerator 6000 Software CD, to enable IPsec support	1	
PCI-X Cards: Storage Interfaces			
SG-(X)PCI2FC-QF4	Dual port 4Gb FC (includes standard and low-profile brackets) , RoHS-6	3	
SG-(X)PCI2FC-QF2-Z	Dual port 2Gb FC, RoHS-6	3	
SG(X)PCI2SCSILM320-Z	Dual port Ultra320 SCSI (includes standard and low-profile brackets), RoHS-6	3	
SG-(X)PCI2FC-EM4-Z	Dual port 4Gb FC	3	Estimated NEBS complete end August 2007
PCI-E Cards: Storage Interfaces			
PCI/PCI-X Cards:Networking			
(X)4445A	Quad GigE, RoHS-6	3	
(X)4151A-2	GigaSwift Ethernet MMF Adapter, RoHS-6	3	
(X)7285A	Dual port GigE UTP , RoHS-6	3	

Please note that the above mentioned X-Option PCI cards have been NEBS tested. As more cards undergo NEBS testing, they will be added to the list.

General Configuration Notes:

1. Single processor systems can be expanded with a second CPU of the identical model/speed only, e.g. AMD Opteron 1x2214 HE embedded class processor based system can only use another AMD Opteron 2214 HE



embedded class processor. Single processor system can also be expanded with one additional hard disk drive to a max. of two drives.

2. The entry-level single CPU standard configuration has only 2 memory slots that are usable; the other 4 memory slots only work if a second CPU is installed. This can be done by purchasing the optional second CPU option.
3. Memory must be installed in pairs. Pairs of different densities may be mixed, e.g. 2X1GB and 2x2GB on CPU 1 memory slots. Symmetry is best for memory performance on 2 CPU systems, e.g. 4 GB should have 2x1GB on CPU 1 memory slots and 2x1GB CPU 2 memory slots. While 5 GB would run (2x1GB on CPU 1, 2x2GBMB on CPU2), it will experience slower memory performance.

XATO Configuration Notes: (Availability August 2007)

1. XATO allows the configuration of systems to exact customer requirements. This provides the customer with a fully tested and configured system that requires little, if any, additional configuration prior to deployment. All XATO orders require a working configuration.
2. A minimum of one CPU option required. Single processor systems can be expanded with a second CPU of the identical model/speed only, e.g. AMD Opteron 1x2214 HE embedded class processor based system can only use another AMD Opteron 2214 HE embedded class processor.
3. A minimum of one memory option per CPU required. Memory must be installed in pairs. Pairs of different densities may be mixed, e.g. 2X1GB and 2x2GB on CPU 1 memory slots. Symmetry is best for memory performance on 2 CPU systems, e.g. 4 GB should have 2x1GB on CPU 1 memory slots and 2x1GB CPU 2 memory slots. While 5 GB would run (2x1GB on CPU 1, 2x2GB on CPU2), it will experience slower memory performance. A fully configured 32 GB system requires two CPUs. Only 16 GB memory is possible in a single CPU system. Example: A single CPU system can utilize up to 2 memory options (4 DIMMs total for a maximum of 16 GB). The unpopulated second CPU socket prevents the use of the second memory bank (4 DIMM slots).
4. A disk filler panel is required for any HDD slot not filled.
5. DVD filler panel is required when selecting the N87-AD-Z or the N87-AA-Z chassis.



Upgrades

Upgrade Paths

Netra™ X4200 M2 servers are eligible for the Sun™ Upgrade Advantage Program (UAP). Through this program customers can trade-up their current Sun or non-Sun servers for a new Netra X4200 M2 server and receive a trade-in allowance that is applied as a percentage off of the list price on the new Netra X4200 M2 server. Customers can trade-in their old systems in on a 1 for 1 server basis or consolidate many servers.

Sun Upgrade Allowance Program (Sun UAP)

Since August 29, 2000, Sun has offered customers a simple, flexible, and easy-to-understand way of ordering server, storage or Desktop upgrades. The Sun UAP program works on a percentage-based upgrades model. This new model simplifies the upgrades process by providing a trade-in value as a percentage allowance. This percentage allowance can then be applied to the list price of a regular Sun system configuration.

Under the Sun UAP program, allowance codes or part numbers have been created and the percentage allowance is built into this part number (see below).

Allowance codes can be found in the Sun Pricebook starting with the September 2000 version. Note that allowance codes apply to configured systems.

Allowance Code Numbering Scheme

Below is an example allowance code, along with a breakdown of the components.

Allowance code = ALW-10-S-L-N87

- **ALW** = Upgrade identifier (All allowance codes start with ALW.)
- **10** = Allowance percentage – Percentage is applied to the list price of a standard marketing part number. “10” means 10% off of list price, “08” means 8% off of list price, and so on.
(Note: Any other discounts such as volume discounts should also be taken off the list price and not the net of the above.)
- **T** = Desktop upgrades, **S** for server upgrades, and **D** for storage upgrades.
- **L** = Indicates the residue group—a way of grouping system in the Sun installed base. The letters A through X are reserved for Sun systems. The letter Z is used for competitive systems.
- **N87** = Identifies the product family that the customer is purchasing.
- **P2 (if there is a promotion)** = Promotion code—used for tracking corporate sponsored and other types of promotions.



How to Determine the Right Allowance Code

Scenario: My customer has a Netra 1120 server and would like to upgrade to a Netra X4200 M2 server. What allowance part number should I select?

1. From left hand column select the platform the **customer has**.
2. The correct allowance part number appears in the right column. The correct number for the Sun Fire 280R server is **ALW-10-S-L-N87**. This part number is applied to the list price of the standard marketing part number. In this case it is a 10% allowance for the old Sun Fire 280R server.

Entry Level Server Upgrade and Allowance Matrix

UPGRADE TO: Netra X4200 M2 Server	
FROM:	
Sun Fire V100, V120, Netra 120 Sun Enterprise™ 250, 220R Netra™ 1120, 1125	ALW-05-S-L-N87
Sun Fire V210, V240, V250 Sun Enterprise 450, 420R, 280R, V440, XX00	ALW-10-S-L-N87
3 to 5-year old competitive systems	ALW-05-S-Z1-N87
Less than 3 year old non-Sun systems	ALW-10-S-Z2-N87

Upgrade Ordering Notes

The ALW code is applied to the system part number. Applying the allowance code will calculate the trade-in allowance percentage off of the list price of the new Netra X4200 M2 server. This trade-in allowance is used in addition to the customer's VEU discount. For a complete list of eligible trade-in products you can go to <http://ibb.eng/>. The customer must order an RMA kit with each upgrade and the customer will be required to trade-in their old servers within ninety days of shipment of the new server. The allowance codes are not applicable to products in CAT D.



Service and Support

Warranty

The Netra™ X4200 M2 server features a 1 year warranty.

- Duration: 1 year, Next Business Day
- HW coverage hours: Business hours
- HW response times: Next business day
- Delivery Method: Parts Exchange or On-site
- HW phone coverage: Business hours
- HW phone response time: 8 hours

Sun Service Plans

Sun Global Customer Services offers a full range of services to assist customers who deploy the Netra X4200 M2 servers. Whether it is architecture services, implementation services, or services to help customers manage the servers once released to production, Sun has the right services during every phase of the project's life cycle.

Sun provides a service plan to meet every customers needs: the SunSpectrum™ Service Plan for full system support ranging from basic to mission critical service levels and the Sun Software Service Plan.

- SunSpectrum Service Plans: Get integrated hardware and software support.
- Sun Software Service Plans: For fundamental software services such as technical phone or web-based support and software maintenance (updates and upgrades), Sun offers two levels of service for production system software.

Why the Warranty Isn't Enough

While computer system warranties provide business customers with some assurance of product quality, they do not provide many essential system services or operating system support. In addition, warranties provide default repair times and coverage hours which may not suit customer needs. It's just that a warranty and a Service Plan are two very different things with two very different objectives. Break/fix is no way to live - make sure your customers have service plan coverage on all their active Sun systems. For more information go to <http://www.sun.com/comparewarranty>.

SunSpectrum Service Plans

SunSpectrum service plans provide integrated hardware and Solaris™ Operating System support for Sun systems as well as comprehensive storage system support. For each Sun system, customers can choose the service plan that best fits their needs. Customers benefit from lower SunSpectrum Instant Upgrade (SIU) pricing when purchasing support at time of system sale.



More information is available at <http://www.sun.com/service/support/sunspectrum>.

SunSpectrum service plan highlights include:

- Integrated whole-system support
- All the essentials for one great price
- Priority service
- No “per incident” limits
- Includes Solaris™ Operating System releases and updates
- Resources for proactive system management
- A choice of four simple plans
- Proven return on investment¹

SunSpectrum Service Plans

Features	Platinum Service Plan Mission-critical Systems	Gold Service Plan Business-critical Systems	Silver Service Plan Basic System Support	Bronze Service Plan Self-Maintenance Support
Telephone and Online Technical Support	24/7 Live transfer	24/7 Live transfer	8-8, M-F Live transfer	8-5, M-F 4hr response
One-stop Interoperability Assistance	Yes	Yes	No	No
Hardware Service Coverage	24/7 2hr On-site Service	8-8, M-F 4hr On-site Service	8-5, M-F 4hr On-site Service	Replacement parts 2nd business day
Solaris™ Releases	Yes	Yes	Yes	Yes
On-demand Solaris™ Updates	Yes	Yes	Yes	Yes
Online System Admin Resources	Yes	Yes	Yes	Yes
Support Notification Services	Yes	Yes	Yes	Yes
SunSpectrum™ eLearning Library	Yes	Yes	Yes	Yes
System Health Check Subscription	Yes	No	No	No
Additional Services for Qualifying Sites	Customer sites meeting an annual SunSpectrum contract minimum (approximately \$160,000 USD) can receive additional services including the creation of a personalized support plan, periodic support reviews, patch assessments and educational services. For local qualification criteria, visit sun.com/service/support/localinfo.html			

- Availability of specific features, coverage hours and response times may vary by location or product.
- Response times are determined by customer-defined priority. The response times shown are for service requests designated by the customer as “Priority 1.”
- To receive the best support, Sun recommends that customers install Sun Net Connect software on SPARC®-based systems. This software creates a secure, customer-controlled link to the Sun Solution Center which helps enable expedited Solaris OS troubleshooting, remote diagnostics, and a number of customer-enabled alerting and reporting functions.

¹Based on Total Economic Impact Study by Forrester Research. This study is available at: sun.com/service/support/sunspectrum



Warranty Upgrade to SunSpectrum Service

The following table includes the part numbers and descriptions for the warranty upgrades to SunSpectrum programs for the Netra X4200 M2 servers.

Part Number	Description
W9D-N87-1P	1-year upgrade to SunSpectrum Platinum sm program for Netra X4200 M2 Server
W9D-N87-24-1G	1-year upgrade to SunSpectrum Gold sm program 24x7 for Netra X4200 M2 Server
W9D-N87-1G	1-year upgrade to SunSpectrum Gold for Netra X4200 M2 Server
W9D-N87-1S	1-year upgrade to SunSpectrum Silver sm program for Netra X4200 M2 Server
W9D-N87-2P	2-year upgrade to SunSpectrum Platinum for Netra X4200 M2 Server
W9D-N87-24-2G	2-year upgrade to SunSpectrum Gold 24x7 for Netra X4200 M2 Server
W9D-N87-2G	2-year upgrade to SunSpectrum Gold for Netra X4200 M2 Server
W9D-N87-2S	2-year upgrade to SunSpectrum Silver for Netra X4200 M2 Server
W9D-N87-3P	3-year upgrade to SunSpectrum Platinum for Netra X4200 M2 Server
W9D-N87-24-3G	3-year upgrade to SunSpectrum Gold 24x7 for Netra X4200 M2 Server
W9D-N87-3G	3-year upgrade to SunSpectrum Gold for Netra X4200 M2 Server
W9D-N87-3S	3-year upgrade to SunSpectrum Silver for Netra X4200 M2 Server

Sunsm System Service Plans for Windows OS

The Sunsm System Service Plans for Windows OS are designed to be flexible enough to cover most customers requirements for support:

Highlights:

- Integrated whole-system support for Sun's X64 systems running Microsoft Windows
- All the essentials for one great price
- Priority service
- No "per incident" limits

Warranty Upgrade to Sunsm System Service Plans for Windows OS for Netra X4200 M2 Server

The following are part numbers and descriptions for the warranty upgrade to Sunsm System Service Plans for Windows OS

Part Number	Description
W9D-N87W-1S	Upgrade to 1 year Sun Windows Silver Support for Netra X4200 M2 Server
W9D-N87W-1G	Upgrade to 1 year Sun Windows Gold Support for Netra X4200 M2 Server
W9D-N87W-1P	Upgrade to 1 year Sun Windows Platinum Support for Netra X4200 M2 Server
W9D-N87W-2S	Upgrade to 2 year Sun Windows Silver Support for Netra X4200 M2 Server
W9D-N87W-2G	Upgrade to 2 year Sun Windows Gold Support for Netra X4200 M2 Server
W9D-N87W-2P	Upgrade to 2 year Sun Windows Platinum Support for Netra X4200 M2 Server
W9D-N87W-3S	Upgrade to 3 year Sun Windows Silver Support for Netra X4200 M2 Server
W9D-N87W-3G	Upgrade to 3 year Sun Windows Gold Support for Netra X4200 M2 Server
W9D-N87W-3P	Upgrade to 3 year Sun Windows Platinum Support for Netra X4200 M2 Server



Warranty Upgrade to Sun HW Only Service for Netra X4200 M2

Part Number	Description
W9D-N87-SD-1H	Upgrade to 1 year Sun HW Only SBD for Netra X4200 M2 Server
W9D-N87-SD-2H	Upgrade to 2 year Sun HW Only SBD for Netra X4200 M2 Server
W9D-N87-SD-3H	Upgrade to 3 year Sun HW Only SBD for Netra X4200 M2 Server
W9D-N87-24-1H	Upgrade to 1 year Sun HW Only 7/24 with 4 hour response for Netra X4200 M2 Server
W9D-N87-24-2H	Upgrade to 2 year Sun HW Only 7/24 with 4 hour response for Netra X4200 M2 Server
W9D-N87-24-3H	Upgrade to 3 year Sun HW Only 7/24 with 4 hour response for Netra X4200 M2 Server
W9D-N87-22-1H	Upgrade to 1 year Sun HW Only 7/24 with 2 hour response for Netra X4200 M2 Server
W9D-N87-22-2H	Upgrade to 2 year Sun HW Only 7/24 with 2 hour response for Netra X4200 M2 Server
W9D-N87-22-3H	Upgrade to 3 year Sun HW Only 7/24 with 2 hour response for Netra X4200 M2 Server



Glossary

Chipkill	A technology developed by IBM for situations that demand high availability. It allows a system (usually CPU or motherboard) to detect problems with the computer's memory and selectively disable the problematic DIMMS.
ECC	Error Correcting Code. A type of memory that corrects errors on the fly.
PCI-E	Peripheral Component Interconnect Express. Formerly known as third-generation I/O, this implementation of the PCI computer bus that uses existing PCI programming concepts and communication standards, but bases it on a much faster serial communications system.
PCI-X	Peripheral Component Interconnect Extended. A computer bus technology that increases the speed that data can move within a computer from 66 MHz to 133 MHz.
SAS	Serial Attached SCSI. The successor to the original SCSI technology with the ability to address up to 16,256 devices per port. It also has a more reliable point-to-point serial connection at speeds of up to 3 Gbps.
Ethernet 10/100/1000Base-T	The most widely used LAN access method defined by the IEEE 802.3 standard; uses standard RJ-45 connectors and telephone wire. 100Base-T is also referred to as Fast Ethernet. And 1000Base-T is also referred to as Gigabit Ethernet.
IKE	Internet Key Exchange. A method for establishing a security association that authenticates users, negotiates the encryption method and exchanges the secret key. IKE is used in the IPSec protocol.
I/O	Input/output. Transferring data between the CPU and any peripherals.
IPSec	IP Security. A security protocol from the IETF (Internet Engineering Task Force) that provides authentication and encryption over the Internet. Unlike SSL, which provides services at layer 4 and secures two applications, IPSec works at layer 3 and secures everything in the network.
IPMI	Intelligent Platform Management Interface. System management architecture for providing an industry-standard interface and methodology for system management.
L2 cache	Also referred to as Ecache or External Cache. A memory cache external to the CPU chip. The AMD Opteron processor integrates 1 MB of L2 cache per CPU.
MTBF	Mean Time Between Failures. The average time a component works without failure.
SNMP	Simple Network Management Protocol. A set of protocols for managing complex networks. The first versions of SNMP were developed in the early 80s. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network. SNMP-compliant devices, called agents, store data about themselves in Management Information Bases



(MIBs) and return this data to the SNMP requesters.

Hot-pluggable	A feature that allows an administrator to add or remove a device such as a disk drive without affecting hardware system integrity.
Hot-swappable	A feature that allows an administrator to remove and/or replace a device without affecting software integrity. This means that, while the system does not need to be rebooted, the new component is not automatically recognized by the system.
Carrier grade	Ruggedized, rack-mountable systems with features including remote alarm capabilities, front-back cooling, front accessibility of media, rear cabling, and rugged NEBS-compliant packaging.
NEBS	Network Equipment Building Standard. A stringent standard for durability, grounding cables, and hardware interfaces specified by Telcordia Technologies (formerly Bellcore) for equipment used in Telco central offices.



Materials Abstract

All materials will be available on SunWIN except where noted otherwise.

Collateral	Description	Purpose	Distribution	Token # or COMAC Order #
Product Literature				
– <i>Netra™ X4200 M2 Server, Just the Facts</i>	Reference Guide (this document)	Training Sales Tool	SunWIN, Reseller Web	496298
– <i>Netra X4200 M2 Server Data Sheet</i>	Data Sheet	Sales Tool	SunWIN, Reseller Web,	496303
– <i>Netra X4200 M2 Server Customer Presentation</i>	Customer Presentation	Sales Tool	SunWIN	496307
– <i>Netra X4200 M2 Server Technical Presentation</i>	Technical Presentation	Training Sales Tool	SunWIN	496309
– <i>Beating IBM with the Netra X4200 M2 Server</i>	Competitive Beatsheet	Sales Tool	SunWIN	496316
White Papers				
- <i>Netra X4200 M2 Server Architecture</i>	White Paper	Sales Tool	SunWIN	496314
External Web Sites				
– <i>General information on the Netra X4200 Server</i>	http://sun.com/netra/X4200			

